Natural Engineer

Version 4.3.1

Release Notes

Manual Order Number: NEE431-008ALL

This document applies to Natural Engineer version 4.3.1 and to all subsequent releases.

Specifications contained herein are subject to change, and these changes will be reported in subsequent revisions or editions.

Readers' comments are welcomed. Comments may be addressed to the Documentation Department at the address on the back cover. Internet users may send comments to the following e-mail address: document@gensystems.com

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ABOUT THIS MANUAL

Purpose of this manual

This manual contains the Release Notes for Natural Engineer version 4.3.1. The information contained in this manual describes the new and modified features of Natural Engineer 4.3.1.

Any obsolete functions are also documented for users of previously released versions of Natural Engineer.

Target Audience

The target audience for this manual is intended to be any user of Natural Engineer 4.3.1 as well as Systems Administrators responsible for installing and configuring the product.

Typographical Conventions used in this manual

The following conventions are used throughout this manual:

UPPERCASE TIMES	Commands, statements, names of programs and utilities referred to in text paragraphs appear in normal (Times) uppercase.
UPPERCASE BOLD COURIER	In illustrations or examples of commands, items in uppercase bold courier must be typed in as they appear.
< >	Items in angled brackets are placeholders for user-supplied information. For example, if asked to enter <file number>, you must type the number of the required file.
Underlined	Underlined parts of text are hyperlinks to other parts within the online source manual. This manual was written in MS-Word 97 using the "hyperlink" feature.

The following symbols are used for instructions:

⇒	Marks the beginning of an instruction set.
❑	Indicates that the instruction set consists of a single step.
1.	Indicates the first of a number of steps.

How this manual is organized

This manual is organized to reflect the new features/enhancements, changes/modifications and documentation updates available with the release of Natural Engineer version 4.3.1.

This manual should be read carefully before installing and using the product.

Chapter	Contents
1	Provides an overview of the new features / enhancements for this release along with any product highlights.
2	Provides details of any existing functionality and/or any functions that have become obsolete for this release.
3	Provides a list of the documentation available for this release along with manual order numbers.

Terminology

It is assumed that you are familiar with general Natural and mainframe terminology, as well as the terms and concepts relating to MS-Windows environments. This section explains some terms that are specific to the Natural Engineer product.

Analysis

The Analysis process of Natural Engineer searches application data within the Natural Engineer Repository, according to specified Search Criteria and generates reports on the search results.

Application

An Application is a library or group of related libraries, which define a complete Application. In Natural Engineer, the Application can have a one-to-one relationship with a single library of the same name, or a library of a different name, as well as related steplibs. The Application refers to all the source code from these libraries, which Natural Engineer loads into the Repository.

Browser

An Internet Browser such as Microsoft Internet Explorer™ or Netscape™.

Category

Categories in Natural Engineer specify whether and how a Modification is applied to the Natural code. Valid categories are: Automatic change, Manual change, Reject the default Modification, No change to the data item, and the data item is in Generated Code.

A category is further broken down according to type of change (for example: Keyword, Literal, Data Item, Database Access, Definition).

Consistency

An option in the Analysis process that causes Natural Engineer to trace an Impact through the code, using left and right argument resolution to identify further code impacted by the code found.

Environment

The Environment process is the means by which Natural Engineer generates a structured view of the application code in the Natural Engineer Repository. This provides application analysis reports and inventory information on the application and is used as the basis for Impact Analysis.

Exception

An Exception is an Item identified as impacted that does not require a Modification. Where there are a few similar Exception Items, they can be treated as Exceptions, and rejected in the Modification review process. Where there are many similar (therefore not Exceptions), consideration should be given to changing the Search Criteria so they are not identified as impacted in the first place.

Generated Code

This is code which has been generated by a Natural code generator, such as Construct, and which is not normally modified directly in the Natural editor.

Impact

An Impact is an instance of a Natural code Item; e.g., data item or statement (a “hit” scored by the Analysis process) that matches the defined Search Criteria used in the Analysis process.

Iteration

An Iteration is one examination cycle of a field identified according to the specified Search Criteria. For example, one Iteration is reading the field right to left. Multiple Iterations are performed when the option of ‘Consistency’ or Multi Search is requested for Analysis, and Natural Engineer performs as many Iterations as necessary to exhaust all possibilities of expressing and tracing the field, and can be limited by a setting in the NATENG.INI file.

Library

A single library of source code, which exists in the Natural system file.

Modification

A Modification is a change suggested or made to an object or data item resulting in the required compliance of that object or data item. Modifications in Natural Engineer are classified according to Category and Type.

Presentation Split Process

The Presentation Split Process is a sub-function of the Object Builder function that removes screen I/O statements from current application objects and places them in generated subprograms.

Soft Link

A Soft Link is where a link between two objects has been defined using an alphanumeric variable rather than a literal constant.

Technical Split Process

The Technical Split Process is a sub-function of the Object Builder function that results in the encapsulation of each database access within the application, into a sub-program so that the application is separated into 'presentation and logic' and 'database access'.

Type

The Type of Modification available, for example: Data Item, Keyword and Literal.

TLM

Text Logic Members are used to contain the code required to support inclusion of common code into the application. An example of this is the code to include into an application before updating a database.

Related Literature

The complete set of Natural Engineer manuals consists of:

1. **Natural Engineer Concepts and Facilities (NEE431-006ALL)**

The Concepts and Facilities manual describes the many application systems problems and solutions offered by Natural Engineer, providing some guidelines and usage that can be applied to Natural applications.

2. **Natural Engineer Release Notes (NEE431-008ALL)**

The Release Notes describe all the information relating to the new features, upgrades to existing functions and documentation updates that have been applied to Natural Engineer 4.3.1.

3. **Natural Engineer Installation Guide (NEE431-010ALL)**

The Installation Guide provides information on how to install Natural Engineer on both PC and mainframe platforms.

4. **Natural Engineer Administration Guide (NEE431-040WIN)**

   Natural Engineer Administration Guide (NEE431-040MFR)

The Administration Guide provides information on all the various control settings available to control the usage of the different functions within Natural Engineer.

5. **Natural Engineer Application Management (NEE431-020WIN)**

   Natural Engineer Application Management (NEE431-020MFR)

The Application Management manual describes all the functions required to add Natural applications into the Repository.

6. **Natural Engineer Application Documentation (NEE431-022WIN)**

   Natural Engineer Application Documentation (NEE431-022MFR)

The Application Documentation manual describes all the available functions to document a Natural application within the Repository. These functions will help enhance / supplement any existing systems documentation such as BSD / CSD / Specifications etc.

7. **Natural Engineer Application Analysis and Modification (NEE431-023WIN)**

   Natural Engineer Application Analysis and Modification (NEE431-023MFR)

The Application Analysis and Modification manual describes all the available functions to carry out analysis of Natural applications; including basic keyword searches. The modification process is described and detailed to show how it can be applied to modify single selected objects within a Natural application, or the entire Natural application in one single execution.

8. **Natural Engineer Application Restructuring (NEE431-024WIN)**

   Natural Engineer Application Restructuring (NEE431-024MFR)

The Application Restructuring manual describes the analysis and modification functionality required to carryout some of the more sophisticated functions such as Object Builder.

9. **Natural Engineer Utilities (NEE431-080WIN)**

   Natural Engineer Utilities (NEE431-080MFR)

The Utilities manual describes all the available utilities found within Natural Engineer and, when and how they should be used.

10. **Natural Engineer Reporting (NEE431-025ALL)**

The Reporting manual describes each of the reports available in detail, providing report layouts, how to trigger the report and when the report data becomes available. The various report-producing mediums within Natural Engineer are also described.

11. **Natural Engineer Batch Processing [Mainframes] (NEE431-026MFR)**

The Batch Processing manual describes the various batch jobs (JCL) and their functionality.

1

FUNCTIONAL CHANGES AND ENHANCEMENTS

Chapter Overview

This chapter covers the new features and enhancements that are available in Natural Engineer version 4.3.1.

The main new features and enhancements are summarized in the following sections:

General

- Task Scheduler
- Natural Runtime support added
- Cancel button functionality for long running tasks
- Natural Classes Support

Reporting

- Program Flow Logic Diagram
- Orphan Analysis Report
- Improved formatting of Data Areas within GenTree
- Language Maps support enhanced
- Field Viewer
- Object Documentation output to Word®
- Entry Point Structure Diagram on Mainframe

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Impact Analysis

- Impact Analysis Multi Search
- Search comments for literals
- Natural 22-3.1; selective processing allowed
- Natural 22-3.1 Functionality Enhanced

Modification

- REINPUT statements will be converted and parameters established to transfer information for Object Builder Line Range modifications
- Multiple modifications per data item in the same statement line now permitted
- TLM processing: Dynamic replacement of operands
- Conversion of Back References and Label Insertion

General

Task Scheduler

The Task Scheduler function allows you to run Natural Engineer Tasks at a time that you specify. For example, you could schedule a Task to extract and load the HOSPITAL application at 23:30 tonight. Recurrent tasks can be set up that run each day, week or month. You can also set dependencies between Tasks. So, you can, for instance, not run Task 0002 until Task 0001 has run successfully.

Initiated Tasks run with their own Natural session and thread into the database. In effect, they run in batch, in that you cannot interact with them whilst they are running. Once finished, there is a log to tell you what happened with the task.

Natural Runtime Support

Natural Engineer v4.3.1 now fully supports running using Natural Runtime. If Natural Runtime is used then the following Natural Engineer features are unavailable:

- Modification
- Beautification
- Change Tracking
- Edit Object
- Jump to Natural Editor

Cancel button functionality for long running tasks

A cancel button has been introduced for ‘batch’ tasks allowing the user to cancel any long running tasks in order to free-up Natural Engineer to proceed with other tasks.

For example: say an Extract and Load task has been initiated to extract and load a very large application into the Repository overnight. The next morning, it is found that the task is still running, rather than wait for completion, the task can be cancelled and re-run at a later (more suitable) time.

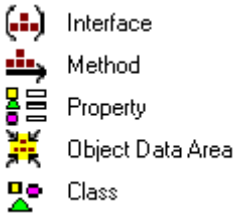
This functionality applies to the following ‘batch’ tasks running under a Windows NT platform: -

- Extract
- Load
- Impact
- Modification

Natural Classes Support

Natural Classes are now fully supported within Natural Engineer. The Object Data Areas, Interfaces and Methods are all identified and shown on the relevant graphical and textual reports. It is also possible to search for DEFINE DATA OBJECT, PROPERTY, METHOD and INTERFACE keywords using Impact Analysis.

The icons that refer to the object types are;



Reporting

Program Flow Logic Diagram

A new function, which will provide structure diagrams based on the Jackson Structured Programming (JSP), methodology. The diagrams are generated directly into Microsoft Viso®.

When the diagram is invoked the Source Code of the object is displayed on the left, and the JSP Structure Diagram is on the right. The main in-line process is displayed on the first Visio "Page" and all the subroutines are on subsequent pages (indicated by the tabs in the lower left of the Visio document).

Double-click on any of the nodes in the JSP diagram, and appropriate line of Source Code is highlighted on the left. Similarly, click on any line of the source code, and the appropriate node is then selected.

It is possible to walk through a process, select a start node in the JSP Structure Diagram, and then use the Ctl + "right arrow" and "left arrow" buttons.

Orphan Analysis Report

The Unused Objects report has now been enhanced to provide full orphan analysis. For example if an object is found to be unused and that object, and ONLY that object, uses another object then that secondary object is also marked as unused.

Improved formatting of Data Areas within GenTree

When a data area, Parameter, Local, Global or Object, is shown within GenTree, the output is now displayed formatted as per the Natural Data Area Editor. Previously the data areas were shown as per the Natural LIST command.

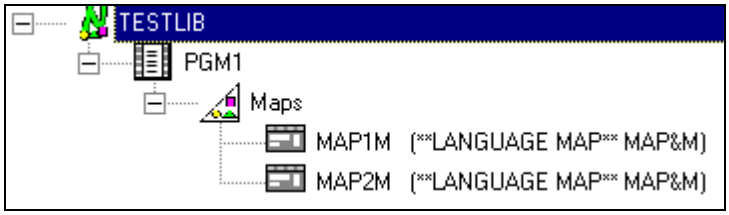
Language Maps Support Enhanced

If a system has been loaded into Natural Engineer that uses language maps then all graphical and textual reports will show all potential maps that could be related. For example a system has two maps MAP1M and MAP2M and a program that calls each map depending on the language setting.

PGM1

```
INPUT USING MAP 'MAP&M'
END
```

Natural Engineer will show each map as being related to the program. For example the GenTree diagram initiated by the Object Viewer function will show the following;



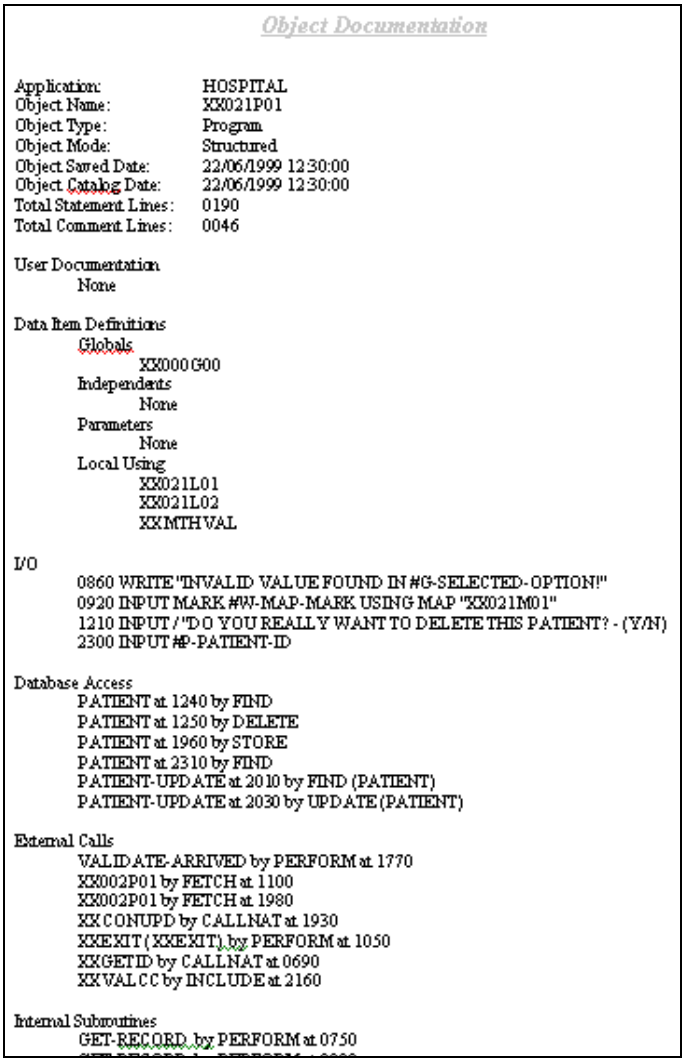
Field Viewer

The Field Viewer has been enhanced to include a context window. When a field has been selected, the user has the ability to select the object in which the field resides. When the object is selected the right hand bottom box of the Field Viewer shows all occurrences of the field within the object selected. A new box has been added to the left-hand bottom side of the dialog that shows the context of the field i.e., where the field is defined, it's definition and it's relationship to other fields.

A context menu has been added to the object selection window on this dialog, which when invoked by clicking the right hand mouse button, allows the user to jump directly to the Object Viewer, Object Documentation or User Documentation options for the object selected.

Object Documentation Output to Microsoft Word®

It is now possible to generate the Object Documentation report directly into Microsoft Word®. A single object may be selected, the whole application or a range of objects using a wildcard. It is still possible to also generate the Object Documentation to the Natural Reporter, HTML or Microsoft Excel®. Each object will be output to a separate page within Word®. Sample Object Documentation output;



Object Documentation

Application: HOSPITAL
Object Name: XX021P01
Object Type: Program
Object Mode: Structured
Object Saved Date: 22/06/1999 12:30:00
Object Catalog Date: 22/06/1999 12:30:00
Total Statement Lines: 0190
Total Comment Lines: 0046

User Documentation
None

Data Item Definitions
Globals
XX000G00
Independents
None
Parameters
None
Local Using
XX021L01
XX021L02
XXMTHVAL

I/O
0860 WRITE 'INVALID VALUE FOUND IN #G-SELECTED-OPTION!'
0920 INPUT MARK #W-MAP-MARK USING MAP 'XX021M01'
1210 INPUT / 'DO YOU REALLY WANT TO DELETE THIS PATIENT? - (Y/N)
2300 INPUT #P-PATIENT-ID

Database Access
PATIENT at 1240 by FIND
PATIENT at 1250 by DELETE
PATIENT at 1960 by STORE
PATIENT at 2310 by FIND
PATIENT-UPDATE at 2010 by FIND (PATIENT)
PATIENT-UPDATE at 2030 by UPDATE (PATIENT)

External Calls
VALIDATE-ARRIVED by PERFORM at 1770
XX002P01 by FETCH at 1100
XX002P01 by FETCH at 1980
XXCONUPD by CALLNAT at 1930
XXEXIT (XXEXIT) by PERFORM at 1050
XXGETID by CALLNAT at 0690
XXVALCC by INCLUDE at 2160

Internal Subroutines
GET-RECORD by PERFORM at 0750

Entry Point Structure Diagram on Mainframe

The Entry Point Structure Diagram is now available on the mainframe.

Impact Analysis

Impact Analysis Multi Search

Impact Analysis Multi Search allows for more advanced search criteria to be specified, including, conditions that are to be included in the analysis, or, excluded from the analysis.

The Multi Search facility allows up to 500 search conditions to be combined. These may be DATAITEM searches, DBFILE searches, LITERAL searches and/or attribute searches.

Search Criteria Types

1) * Comment line.
Useful for managing groups and changes in the list.

2) A Absolute exclude field.
This exclude should be located before any other entries, if a field matches this option then it is immediately and permanently excluded.

3) X Exclude field.
All excluded field-names must be located before "I" type fields in order to benefit from the "Byte-Lockout" process (see note below). Parts of a field can be excluded in this way, while the remainder of the field is still searched for inclusion.

4) I Include field.
All fields of this type are included in the impact results. A search criteria without wildcards e.g., I DATE is an absolute include.

5) IA Include format.
All fields of this type are included in the impact results. You can specify format ranges:

N1-N20 will include all fields of type N from 1 to 20 including e.g., N6.2
P5.2-P9.2 will include all number defines from 5.2 to 9.2. Any commas entered are changed to decimal points internally to Natural Engineer. For modification they are converted back to commas.
N-N999 will find all numeric type fields

6) XA Exclude format.
All fields with this format (e.g., A001, N001) are excluded from the impact results when found on the first iteration. Ranges can be specified, see IA for examples.

7) IL Include Literal.
Search for literals the same as fields

8) XL Exclude Literal.
Exclude literals the same as for fields.

9) XD Exclude Decimals.
Exclude data items that contain decimals.

Criteria

This identifies the value to be searched. The following wildcards may be used:

?-YY	Finds fields ending in -YY
YY?	Finds fields starting with YY
?YY?	Finds fields containing YY

For the Include and Exclude Options(I and X) it is also possible to include or exclude by name and length by additionally adding a single format or a range.

X ?FRED? (A10) will exclude FRED if the length is A 10

Byte Lockout

This is a unique technique to handle parts of field names that may be included or excluded in the impact reports, depending on the defined search criteria.

For example, if you define UPDATE to be excluded but DATE to be included in the search, the UPDATE part of the field UPDATE-DATE will be excluded, but the DATE part will be included for further processing. Conversely, the field UPDATE will be excluded as defined, and not be included merely on the basis of the inclusion of DATE. This process works for Literals as well as fields.

Search Comments for Literals

The literal searching option on Impact Analysis has been improved so that the user's may also search for literals in comments. When a LITERAL search criteria has been selected there is the ability to select an Options button. This will show the Options available for a Literal scan. The WORD and CASE options work as in previous Natural Engineer releases.

Comment Options

Include Comments
The Literal value specified will be searched against actual Natural code and comments.

Exclude Comments
The Literal value specified will only be searched against actual Natural code. This is the default.

Comments Only
Only comments will be searched for the Literal value specified.

Modification is not available for literals within comments.

Natural 2.2-3.1 Selective Processing Allowed

Previous releases of Natural Engineer have identified all inconsistencies between Natural 2.2 and Natural 3.1. However users may only want to search for one specific inconsistency e.g., Obsolete Error Messages or phase the impact analysis runs. To this effect, the ability to selectively identify which particular inconsistency, or combination of inconsistencies, a user can search for has been added.

Natural 2.2-3.1 Functionality Enhanced

The Natural 2.2-3.1 Impact Analysis function has been enhanced to additionally identify the following scenarios;

Numeric Redefinitions of Alpha fields and MOVE BY NAME

Description	If an object has a MOVE BY NAME where there are redefinitions of alpha fields to numerics and the source and target numeric field are the same length, you receive different results under Natural 3.1 compared to Natural 2.2.
	
	For instance:
	
	`DEFINE DATA LOCAL`
	`01 #OLD`
	`  02 #ALPHA (A10)`
	`  02 REDEFINE #ALPHA`
	`    03 #ALPHA1 (A1)`
	`    03 #NUMERIC (N9)`
	`01 #NEW`
	`  02 #ALPHA (A10)`
	`  02 REDEFINE #ALPHA`
	`    03 #ALPHA1 (A1)`
	`    03 #NUMERIC (N9)`
	`END-DEFINE`
	`MOVE BY NAME #OLD TO #NEW`
	`WRITE 'RESULT:' #OLD #NEW`
	`END`
	
	Under Natural 2.2, the result is:
	
	`RESULT:`

	So, the receiving field is {blank} Under Natural 3.1, the result is: `RESULT:  000000000` The numeric redefinition #NUMERIC now contains zeros Please note that this only occurs if: • Both the source and target numeric field are part of a redefine of an alpha field. • Both the source and target fields are of format type N. • The source and target fields are the same length.
NEE Impact	Natural Engineer will identify all instances.
NEE Modification Type	33 GSL10
NEE Modification	Manual

Modification

Object Builder Line Ranges: REINPUT statements

If a user is using the Object Builder functionality to split out the business logic from the object to possibly use this to implement client-server type architecture using EntireX, there is a problem with REINPUT statements as this will not work across this architecture.

Under Natural Engineer 4.3 the process has been modified so that Natural Engineer automatically alters the code so that the REINPUT is replaced and the relevant parameters are established to transfer.

For example, the following object has been selected to be converted.

```
0010 DEFINE DATA LOCAL
0020 /*
0030 01 #A (A10)
0040 /*
0050 END-DEFINE
0060 /*
0070 INPUT USING MAP 'REINPMAP'
0080 /*
0090 IF #A EQ ' '
0100   REINPUT 'INVALID VALUE DETECTED' MARK *#A
0110 END-IF
0120 /*
0130 IF #A NE 'B'
0140   REINPUT *1212
0150 END-IF
0160 /*
0170 END
```

The Object Builder range has been specified as 0090-0150. This range encompasses some REINPUT statements therefore Natural Engineer needs to build the relevant objects and parameters. It does this automatically.

```
0010 DEFINE DATA LOCAL
0020 /*
0030 01 #A (A10)
0040 /*
0050 01 #NEE@REINPUT-MSG (A79)  /* NATENG Modified
0060 01 #NEE@REINPUT-MARK (I4)  /* NATENG Modified
0070 01 #NEE@REINPUT-REPLY (I4) /* NATENG Modified
```

```
0080 01 #NEE@REINPUT-MSG# (I4)              /* NATENG Modified
0090 01 #NEE@REINPUT-GROUP                  /* NATENG Modified
0100   02 #NEE@REINPUT-FIELD (A65/1:50)     /* NATENG Modified
0110   02 #NEE@REINPUT-FIELD-POS (I04/1:50) /* NATENG Modified
0120 END-DEFINE
0130 /*
0140 INPUT USING MAP 'REINPMAP'
0150 /*
0160 /* IF #A EQ ' '                                  /* NEE OLD CODE
0170 /*   REINPUT 'INVALID VALUE DETECTED' MARK *#A /* NEE OLD CODE
0180 /* END-IF                                       /* NEE OLD CODE
0190 /* /*                                           /* NEE OLD CODE
0200 /* IF #A NE 'B'                                 /* NEE OLD CODE
0210 /*   REINPUT *1212                              /* NEE OLD CODE
0220 /* END-IF                                       /* NEE OLD CODE
0230 RESET #NEE@REINPUT-REPLY                     /* NATENG Modified
0240 MOVE '#A' TO #NEE@REINPUT-FIELD(1)           /* NATENG Modified
0250 ASSIGN #NEE@REINPUT-FIELD-POS(1) = POS(#A)   /* NATENG Modified
0260 CALLNAT 'REINPN1'                            /* NATENG Modified
0270   #NEE@REINPUT-MSG                           /* NATENG Modified
0280   #NEE@REINPUT-MARK                          /* NATENG Modified
0290   #NEE@REINPUT-REPLY                         /* NATENG Modified
0300   #NEE@REINPUT-MSG#                          /* NATENG Modified
0310   #NEE@REINPUT-GROUP                         /* NATENG Modified
0320   #A                                         /* NATENG Modified
0330 DECIDE ON FIRST VALUE OF #NEE@REINPUT-REPLY /* NATENG Modified
0340   VALUE 0                                    /* NATENG Modified
0350     IGNORE                                   /* NATENG Modified
0360   VALUE 9999                                 /* NATENG Modified
0370     REINPUT #NEE@REINPUT-MSG MARK            /* NATENG Modified
0375              #NEE@REINPUT-MARK               /* NATENG Modified
0380   VALUE 9998,9997                            /* NATENG Modified
0390     REINPUT *#NEE@REINPUT-MSG# MARK          /* NATENG Modified
0395              #NEE@REINPUT-MARK               /* NATENG Modified
0400   NONE VALUE                                 /* NATENG Modified
0410     COMPRESS 'UNKNOWN RSP FROM VALIDATION'   /* NATENG Modified
0420       #NEE@REINPUT-REPLY                     /* NATENG Modified
0425       INTO #NEE@REINPUT-MSG                  /* NATENG Modified
0430     REINPUT #NEE@REINPUT-MSG                 /* NATENG Modified
0440 END-DECIDE                                   /* NATENG Modified
0450 /*
0460 END
```

Notice the introduction of REINPUT fields. These contain the data required to feed back the response codes back to the calling program from the newly generated subprogram. After the CALLNAT to the newly generated subprogram, you will notice a DECIDE statement, checking the REINPUT values returned and acting accordingly.

PDA generated:

```
0010 DEFINE DATA PARAMETER
0020 1 #NEE@REINPUT-MSG(A79)
0030 1 #NEE@REINPUT-MARK(I4)
0040 1 #NEE@REINPUT-REPLY(I4)
0050 1 #NEE@REINPUT-MSG#(I4)
0060 1 #NEE@REINPUT-GROUP(1:50)
0070 2 #NEE@REINPUT-FIELD(A65)
0080 2 #NEE@REINPUT-FIELD-POS(I4)
0090 1 #A(A010)
0100 END-DEFINE
```

Subprogram generated:

```
0010 * Subprogram: REINPN1
0020 ************************************
0030 * Created by NEE on 2001-07-03 at 14:01:32.7
0040 * Created from REINP from line range 0090-0150
0050 ************************************
0060 DEFINE DATA
0070 PARAMETER USING REINPA1
0080 *
0090 LOCAL
0100 01 #NEE@REINPUT-INDEX (I04)
0110 *
0120 END-DEFINE
0130 IF #A EQ ' '
0140   MOVE 'INVALID VALUE DETECTED' TO #NEE@REINPUT-MSG
0150   FOR #NEE@REINPUT-INDEX = 1 TO 50
0160     IF #NEE@REINPUT-FIELD(#NEE@REINPUT-INDEX) EQ '#A'
0170       MOVE #NEE@REINPUT-FIELD-POS(#NEE@REINPUT-INDEX) TO
0180         #NEE@REINPUT-MARK
0190       ESCAPE BOTTOM
0200     END-IF
0210   END-FOR
0220   MOVE 9999 TO #NEE@REINPUT-REPLY
0230   ESCAPE ROUTINE
0240   /*   REINPUT 'INVALID VALUE DETECTED' MARK *#A
0250 END-IF
0260 /*
0270 IF #A NE 'B'
0280   MOVE 1212 TO #NEE@REINPUT-MSG#
0290   MOVE 9998 TO #NEE@REINPUT-REPLY
0300   ESCAPE ROUTINE
0310   /*   REINPUT *1212
0320 END-IF
0330 END
```

Multiple modifications per data item in the same statement line

It is now possible to apply multiple modifications per data item in the same statement line. Previous versions of Natural Engineer restricted the amount of automatic modifications possible to one line of code. This restriction has now been removed.

TLM processing: Dynamic replacement of operands

If you use a TLM to replace a given statement, then it is now possible to use the same defined operands (variables) used in the original statement, within the replacement TLM.

For instance, if you were wishing to replace all MOVE statements with ASSIGN, you would define an impact search criteria of MOVE specifying a replace TLM. An example TLM is:

```
0010 /* ------------------------------------------------------------
0020 /* START OF TLMDYNAM
0030 /* ------------------------------------------------------------
0040 ASSIGN XX-OPER2 = XX-OPER1
0050 **NEE XX-OPER3
0060 ASSIGN XX-OPER3 = XX-OPER1
0070 **NEE BLOCK-END
0080 **NEE XX-OPER4
0090 ASSIGN XX-OPER4 = XX-OPER1
0100 **NEE BLOCK-END
0110 **NEE XX-OPER5
0120 ASSIGN XX-OPER5 = XX-OPER1
0130 **NEE BLOCK-END
0140 **NEE XX-OPER6
0150 ASSIGN XX-OPER6 = XX-OPER1
0160 **NEE BLOCK-END
0170 /* ------------------------------------------------------------
0180 /* END OF TLMDYNAM
0190 /* ------------------------------------------------------------
```

A sample copy of this TLM, TLMDYNAM, is supplied in the SYSNEE directory.

Operands from the original statement are accessed by using XX-OPERx. Up to 10 operands are catered for.

Conditional logic can be used in the replace TLM. Line # 0050, **NEE XX-OPER3 is stating that if operand 3 is present, then the block of code up to the next **NEE BLOCK-END (line # 0070) is included in the modified object.

So, if we take the following program:

```
0010 DEFINE DATA LOCAL
0020 01 #A  (A10)
0030 01 #B  (A10)
0040 01 #C  (A10)
0050 01 #D  (A10)
0060 01 #E  (A10)
0070 END-DEFINE
0080 /*
0090 MOVE #A TO #B #C #D #E
0100 /*
0110 END
```

For the MOVE statement, the operands would be:

XX-OPER1 #A
XX-OPER2 #B
XX-OPER3 #C
XX-OPER4 #D
XX-OPER5 #E
XX-OPER6 {Not Available}

The following is the modified object:

```
0010 DEFINE DATA LOCAL
0020 01 #A  (A10)
0030 01 #B  (A10)
0040 01 #C  (A10)
0050 01 #D  (A10)
0060 01 #E  (A10)
0070 END-DEFINE
0080 /*
0090 /* MOVE #A TO #B #C #D #E /* NEE OLD CODE
0100 /*
0110 /* ------------------------------------------------------------------
0120 /* START OF TLMDYNAM
0130 /* ------------------------------------------------------------------
0140 ASSIGN #B = #A
0150 ASSIGN #C = #A
0160 ASSIGN #D = #A
0170 ASSIGN #E = #A
0180 /* ------------------------------------------------------------------
0190 /* END OF TLMDYNAM
0200 /* ------------------------------------------------------------------
0210 END
```

Conversion of Back References and Label Insertion

The Application Standards function of Natural Engineer has the ability to convert back references to labels and generate Database and non-Database labels. Previous releases of Natural Engineer only identified the back references and the possible position of the labels. Natural Engineer v4.3 now provides automatic modification for these functions.

If you have selected to generate Database labels, Natural Engineer will automatically add labels for all Database access statements.

If you have selected to generate non-Database labels, Natural Engineer will automatically add labels for all relevant non-Database statements e.g., FOR, REPEAT.

If you have selected to convert back references, Natural Engineer will automatically add labels for Database and non-Database statements if a back reference refers to the statement and no label is present and convert the back reference to the label name. If the code has an existing label for that statement then Natural Engineer will use that.

The generated label names are based on a combination of statement and line number thus ensuring uniqueness. The label name can be overridden by the user during the modification phase.

Additional Entries in the NATENG.INI and CINI

The following changes have been made to the INI and CINI files for this version of Natural Engineer. Please review the appropriate section of the Natural Engineer User Guide for a detailed explanation about each entry in the INI file. On the PC, the NATENG.INI file may be maintained via the Options->Administration-> Initialization Settings option from the main menu.

New and Modified Settings

COMMENT-OLD-LINE

Used in Modification, COMMENT-OLD-LINE determines whether the old line of code should be commented out in the modified source or not copied to the modified source.

```
[MODIFY]
COMMENT-OLD-LINE=
```

Values
Y = yes (Default)
N = no

GENFLOW

```
[VISIO]
EXE=C:\PROGRAM FILES\SOFTWARE AG\NEE\V431\BIN\GENFLOW.EXE
```

If the user is using Microsoft® Visio2000® then GENFLOW.EXE should be set as the executable within the VISIO section. GENFLOW.EXE replaces the NATVIS2000.EXE from previous Natural Engineer Releases. This setting is valid for the PC only.

DEFAULT-OUTPUT

```
[REPORTER]
DEFAULT-OUTPUT=
```

If a report is defined in the [REPORTER] section, then the setting for the report is taken as the DEFAULT-OUTPUT type. If the report is not defined, then the setting for DEFAULT-OUTPUT is selected.

If neither exist, then the default output is set to Natural Reporter. Valid settings in this section are;

Settings:

N - Screen output.

X - Excel output.

Y - Natural Reporter output.

H - Applies to REPDOC. Output to HTML format.

W – Applies to REPDOC. Output to WORD format.

B - Applies to IMRSRC, IMPSRC, RMRSRC. Output in HTML to browser.

Removed Settings

TREEVIEW: FUSER

From NEE 4.3, the source code for GenTree is obtained through a Natural Class. Therefore the FUSER setting in the [TREEVIEW] section is no longer required.

```
; FUSER=C:\PROGRAM FILES\SOFTWARE AG\NATURAL\NATAPPS\FUSER
```

VISIO: ABC

From NEE 4.3, ABC Flowcharter is no longer supporter. The following setting has therefore been removed from the [VISIO] section

; ABC=Y

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OBSOLETE FUNCTIONALITY

Chapter Overview

This chapter covers all the functionality that has been removed from Natural Engineer version 4.3.1 and are now obsolete. The following summary list shows the obsolete functions:

1. Work File 2 within Extract Process
2. NAT31CNV.IRE Supplied Search Criteria
3. Support for ABC Flowcharter removed

Obsolete Functionality

Work File 2 within Extract Process

Work File 2 [########.IN] is no longer used by the Extract process. This work file did contain the extract selection criteria as defined via the extract selection criteria screen, for use by the extract process. These details are now stored on the Natural Engineer Repository.

NAT31CNV.IRE Supplied Search Criteria

The Natural 2.2 to 3.1 version upgrade impact analysis used to utilize a NAT31CNV.IRE search criteria which was specified in the DATA directory of Natural Engineer on the PC or the supplied search criteria for NAT31CNVthat was loaded during installation on the mainframe. This impact analysis no longer utilizes this search criteria. To run this version upgrade only the MVSNAT2231 search criterion needs to be specified. The users must then select which specific upgrade option they wish to check via the options screen. The default is to check for all.

Support for ABC Flowcharter Removed

Support for ABC Flowcharter has been removed for Natural Engineer v4.3. The recommended diagramming tool is Microsoft VISIO 2000®.

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DOCUMENTATION

Chapter Overview

Documentation Redesigned

The documentation set for Natural Engineer has been completely revamped for Natural Engineer v4.3. For a full set of documentation available with Natural Engineer 4.3.1 please refer to the Related Literature section in the About this Manual chapter.

New Examples Library

Natural Engineer now supplies an examples library which illustrates some of the more advanced features of Natural Engineer. This library is called NEEEXPG and is loaded to your FUSER during installation.

New Compiled HTML Help

Natural Engineer now supplies online help for the PC in compiled HTML format. If you encounter an error message when invoking online help for the first time, you probably require an update to your Windows help system. Please check the following Microsoft web page for the appropriate update file:

http://msdn.microsoft.com/workshop/author/htmlhelp/localize.asp

A version of the update files can also be found in the subdirectory

\Help on the Natural Engineer 4.3.1 CD-ROM.

You will find further information about HTML help :

http://msdn.microsoft.com/workshop/c-frame.htm?939819049321#/workshop/author

Note: In order to access HTML Help, the underlying components of Microsoft Internet Explorer 4.x (or later) must be installed.

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